The Internet Model and Ecosystem

The Internet Society

- Founded in 1992 by Internet pioneers
- International non-profit organization
  - 90+ organization members
  - 28,000+ individual members
  - 90+ chapters worldwide
  - Regional bureaus: Africa, Europe, Latin America & Caribbean, North America South & South East Asia
- ISOC is an international cause-related organization that works for the open development and evolution of the Internet for all people.
- We do so through work across the areas of technical standards, education and capacity-building as well as public policy.

The Internet Today

- A complex system, still evolving rapidly
- Nowhere near being a “legacy” system
- A “network of networks” working cooperatively
- Intelligence predominantly at the edges
- Proven to be flexible, adaptable and responsive to users’ needs
- But the Internet presents a challenge to traditional governance players and mechanisms
  - The Internet is inherently global, and therefore trans-jurisdictional
  - There is no shared model for what is acceptable and what is not (with obvious exceptions)
  - Nothing new, but the challenges can appear to be new

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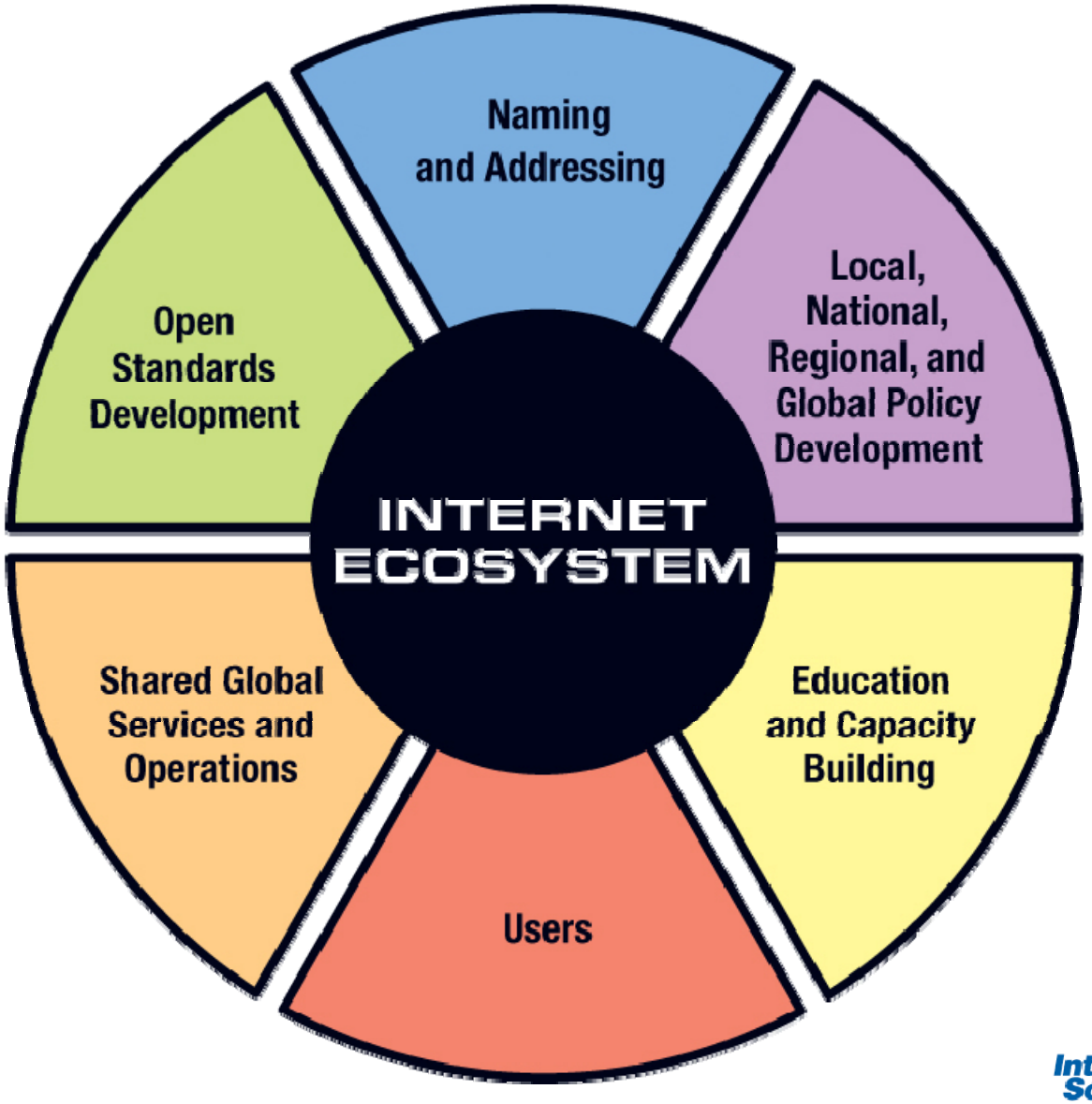
Internet Model

The Internet is successful in large part due to its unique model of development and deployment:

- Shared global ownership – no central control
- Open technical standards
- Collaborative Engagement models – researchers, business, civil society, government
- Freely accessible processes for technology and policy development
- Transparent and collaborative governance



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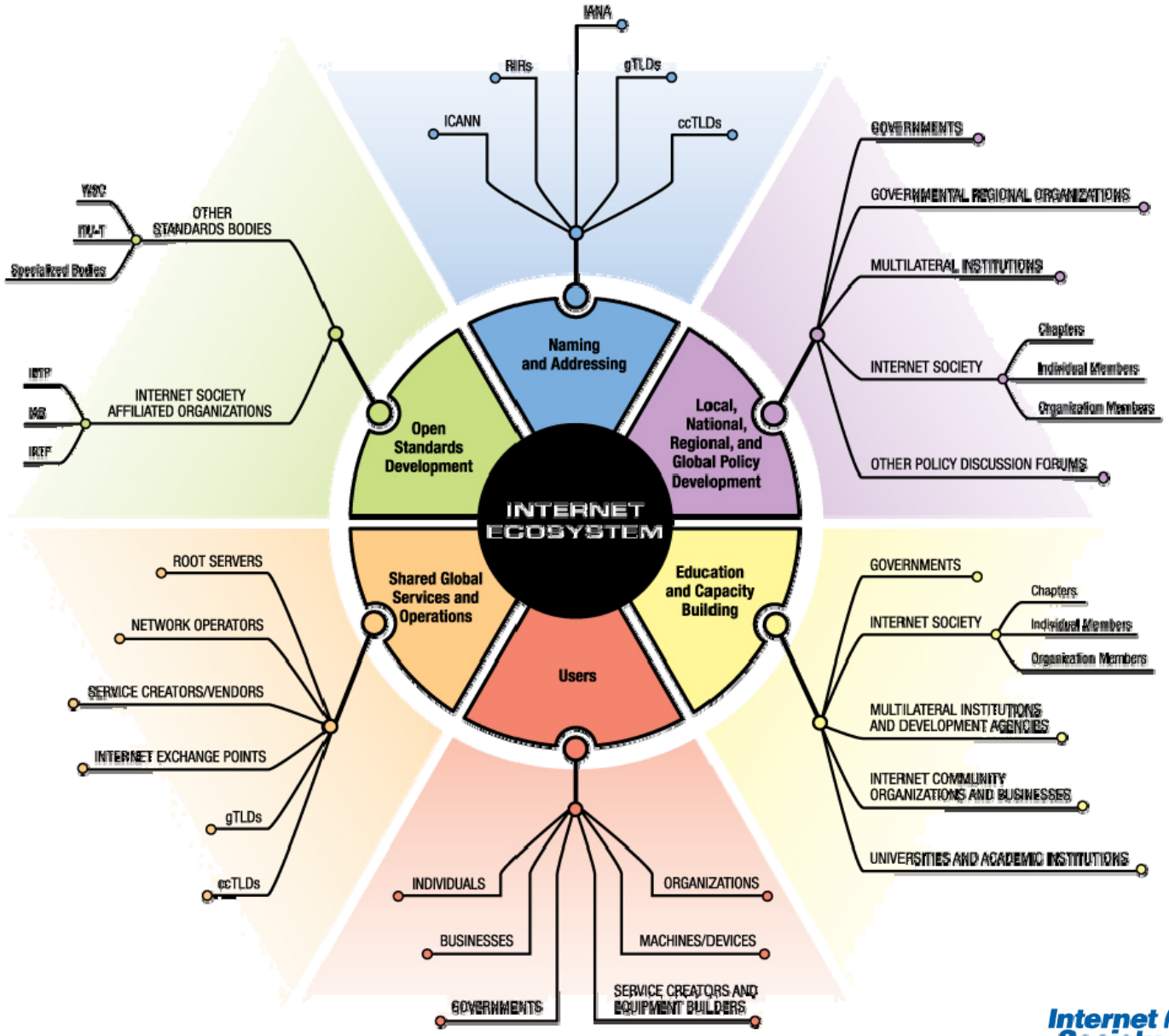
On the Specific Area of Traffic Management

Who	Role	Challenges
Open Standards Development	Develop globally applicable technical standards for the handling of Internet traffic	Specific commercial interests -- seeking to promote particular kinds of applications, services, or network technologies
Shared Global Services and Operations	Provide unprejudiced service to all for all	Threats to security, defend against abuse, desire to offer advanced services
Users	Expect unlimited access to the global Internet, using the best network available or agreed to	Understanding service offerings; taking the open Internet for granted
Education and Capacity Building	Ensure the network is global in reach and application of operational standards	Resources; addressing advanced network challenges (i.e. congestion) on limited and possibly aged network infrastructure
Naming and Addressing	Uniform access to global identifiers	Running out of IPv4 (prevalence of NATs); new network opportunities exceed IPv4 (China Mobile; SmartGrid, etc)
Local, National, Regional and Global Policy Development	Protect the public interest; meet national goals	The Internet is global, not national


INTERNET ECOSYSTEM
Naming and Addressing
IANA
RIRs
gTLDs
ICANN
ccTLDs
Local, National, Regional, and Global Policy Development
GOVERNMENTS
GOVERNMENTAL REGIONAL ORGANIZATIONS
MULTILATERAL INSTITUTIONS
INTERNET SOCIETY
Chapters
Individual Members
Organization Members
OTHER POLICY DISCUSSION FORUMS
Open Standards Development
OTHER STANDARDS BODIES
W3C
ITU-T
Specialized Bodies
INTERNET SOCIETY AFFILIATED ORGANIZATIONS
IETF
IAB
IRTF
Education and Capacity Building
GOVERNMENTS
INTERNET SOCIETY
Chapters
Individual Members
Organization Members
MULTILATERAL INSTITUTIONS AND DEVELOPMENT AGENCIES
INTERNET COMMUNITY ORGANIZATIONS AND BUSINESSES
UNIVERSITIES AND ACADEMIC INSTITUTIONS
Shared Global Services and Operations
ROOT SERVERS
NETWORK OPERATORS
SERVICE CREATORS/VENDORS
INTERNET EXCHANGE POINTS
gTLDs
ccTLDs
Users
INDIVIDUALS
ORGANIZATIONS
BUSINESSES
MACHINES/DEVICES
GOVERNMENTS
SERVICE CREATORS AND EQUIPMENT BUILDERS

Congestion Management in Historical Perspective

Past…

- Congestion collapse in IP networks was predicted in mid-1980's
  - See RFC896, January 1984
- In fact – observed in October 1986
  - NSFnet phase-I backbone dropped three orders of magnitude from its capacity of 32 kbit/s to 40 bit/s
- Was resolved by development and implementation of new congestion control technology
  - Van Jacobson's congestion control standard
  - Implemented in Internet late 1980's (1987- on)

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Present

- 2007 Comcast & BitTorrent
  - Comcast accused of blocking / deprecating BitTorrent P-2-P traffic
  - Comcast trying to ensure reasonable network conditions for latency- and bandwidth-sensitive applications (VoIP)
- 2008 -- Comcast & BitTorrent respond constructively to FCC ruling
  - Take discussion to appropriate open forums (IETF) to work out interoperable standards
- Discussions on-going

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…Future

- Researchers looking at more powerful, scalable technologies to give networks ability to tune and/or charge
  - application-agnostic
  - not prescriptive on other networks' behaviour
- The work
  - Bob Briscoe, BT – re-ECN (congestion exposure)
  - Beginning work at IETF
  - Discussed at meeting of international corporation C-level
    - GIIC, London, September 2009
    - http://www.giic.org/pdf/LondonWorkshopReportFinal.pdf
- The opportunities
  - Comcast, others, recognizing better solutions must interoperate between networks
  - Not just about control of traffic, but also about providing ability to have traffic senders take responsibility